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A 423.9  
F 764

copy 2 U.S. DEPARTMENT OF AGRICULTURE FOREST PEST LEAFLET 34  
Forest Service Issued February 1959

U. S. DEPT. OF AGRICULTURE  
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Revised May 1968

JUL 27 1968  
CURRENT SERIAL RECORDS  
**Neodiprion Taedae Linearis:**  
**A Sawfly Pest of Loblolly and**  
**Shortleaf Pines**

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The sawfly *Neodiprion taedae linearis* Ross in recent years has become recognized as one of the most serious insect pests in loblolly and shortleaf pine stands in the south-central States. Although the attacks seldom, if ever, kill trees, the larvae of the insect cause huge losses by destroying needles and thus retarding growth.

This sawfly was first observed in 1940 on loblolly pine in southern Arkansas. An outbreak covering a gross area of some 3 million acres occurred in that State from 1945 to 1948. Studies made then produced the first evidence that attacks markedly reduce diameter growth.

The insect has since been found in eastern Oklahoma, southeastern Texas, southeastern Missouri, northern Arkansas, central Louisiana, and northern Mississippi. Large-scale infestations occur in these areas periodically; the most recent was on 750,000 acres in southern Arkansas in 1964 and 1965.

### Hosts

In Texas, Arkansas, and Louisiana, the chief host tree for this saw-

fly is loblolly pine. Shortleaf pine is seldom more than lightly infested even when growing in mixture with severely defoliated loblolly. In other areas, these two pines and occasionally longleaf pine are attacked indiscriminately. Medium or large trees in forests are preferred, but occasionally open-growing stands of saplings are attacked.

### Injury

Newly hatched larvae feed in groups, often with five or six tiny black-headed larvae completely encircling each needle. They girdle the needle by consuming the soft outer tissue, leaving the remainder to turn reddish brown. Twigs on which the needles have been thus damaged and discolored are often called "flags" because they can be observed easily from the ground or from low-flying aircraft. Older larvae feed singly or in pairs and consume the entire needle, leaving short stubs on the branch. They still retain their gregarious habit, however, and move in feeding groups from branch to branch (fig. 1).

Usually only the older foliage is eaten, but on shortleaf pine the terminal buds and tender bark on the new growth also are occasionally consumed. In heavily infested areas (fig. 2) trees may be completely defoliated early in the spring before

<sup>1</sup>The author is indebted to Dr. L. O. Warren and his associates at the University of Arkansas, Fayetteville, Ark., for information on areas infested, certain aspects of the insect's biology, and all data relative to the use of insecticides other than DDT.





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**Figure 1.**—Larvae feed in groups, defoliating one twig after another.

the new shoots and needles have developed. New foliage restores the trees to a nearly normal appearance within a few months, and so far no trees are known to have died from defoliation by this sawfly. Diameter growth, however, may be reduced by 50 percent or more for several years following one heavy defoliation.

### **Description**

The female adult is about  $\frac{3}{8}$  inch long with four wings, an orange and black body, and threadlike antennae. The male is about  $\frac{1}{4}$  inch long with four wings, an entirely black body, and feathery antennae.

The newly hatched larva has a shiny black head and a gray-green body. Older larvae have dull green bodies with heavy black stripes along each side and often two lighter stripes below the heavy ones. When full grown, the feeding larva is about 1 inch long and has a dark

brown head. The final nonfeeding stage or capsule-spinning larva has a brownish body and gray head.

### **Life History**

There is only one generation each year. The eggs hatch from early March until mid-April, depending upon local weather conditions. A larva completes its development in 30 to 40 days and then drops to the ground to spin a mahogany-colored capsulelike cocoon in the topsoil or litter. Most larvae pupate and emerge from the cocoons in October and November, but a small portion may remain until the next fall or a later fall before completing development. Mating and egg laying begin soon after adult emergence. The female cuts or "saws" from 1 to 20 pockets in each of several needles and deposits a small whitish-yellow egg in each slit. The distance between the egg slits on the needle is about the length of the female's





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Figure 2.—Mature trees, as well as open-grown saplings, may be completely defoliated by this sawfly.

body. Each female lays from 90 to 120 eggs, often all in the needles of one twig. The egg is the overwintering stage.

### Control

An important natural control agent is a polyhedral virus that sometimes destroys many of the larvae. Sustained low temperatures and

rain in the spring also render the larvae inactive, so many probably die from starvation or disease. Sometimes rodents destroy many cocoons. So far, very little predation by birds has been observed.

More than 20 species of parasites have been collected or reared. Perhaps the most important of these parasites are a parasitic fly, *Villa*

*sinuosa sinuosa* (Wied.), and an ichneumon wasp, *Exenterus canadensis* (Prov.). No egg parasites have been collected.

Since this sawfly is found chiefly on medium or large trees in forest stands, aerial spraying is the most economical form of control. For best results, insecticides should be applied as soon as possible after the eggs have hatched in the early spring.

Because of its long residual action and possible detrimental effect upon wildlife, DDT, although effective, is not now being recommended as an aircraft-applied insecticide over forest lands. Two insecticides that have recently been successful in aerial application against this sawfly are:

Diazinon<sup>2</sup> AG-500 (1/2 pint of the emulsifiable concentrate in 2 gallons of water per acre).

Dimethoate<sup>2</sup> 4 E (1/4 pint of the concentrate in 2 gallons of water per acre).

**Caution:** Insecticides used improperly can cause injury to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the container label. Do not exceed the maximum dosage suggested. Always apply the least amount of an insecticide required. To minimize drift, apply when there is little or no wind; to protect fish and wildlife, avoid chemical contamination of streams, lakes, and ponds. Insecticides should be kept in closed, well-labeled containers, in a dry place where they will not contaminate food or feed, and where children and animals cannot reach them.

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<sup>2</sup> Mention of these names is for information only and does not constitute a guarantee, warranty, or endorsement of the products by the U.S. Department of Agriculture, or preference over other products not mentioned.

